

Contents

VOLUME IV, PART 1

Chapter 17	The Restricted Three-Body Problem	1
	THE RESTRICTED THREE-BODY PROBLEM	1
17.1	Small Libration about Equilibrium Points	1
17.2	Infinitesimal Orbits about L_4 or L_5	7
17.3	Zero-Velocity Curve	16
17.4	Darwin's Periodic Orbits	33
17.5	Strömngren's Survey of Periodic Orbits	36
17.6	Hénon's Computation of Periodic Orbits	47
17.7	Korteweg's Theorem	70
17.8	Whittaker's Theorem	74
	REGULARIZING TRANSFORMATIONS	81
17.9	Conformal Transformation	81
17.10	Thiele's Transformation	84
17.11	Lindow's Transformation	87
17.12	Levi-Civita's Transformation	97
17.13	Birkhoff's Transformation	100
17.14	Koopman's Transformation	106
17.15	Lemaître's Regularization	109
17.16	Sundman's Transformation	127
17.17	Arenstorf's Transformation	129
17.18	Kustaanheimo's Spinor Regularization	135
17.19	Three-Dimensional Extension of Birkhoff's Transformation	146
17.20	Star Clusters as the N -Body Problem	162

Chapter 18	Poincaré's Theory of Periodic Solutions	183
	POINCARÉ'S LEMMA	183
18.1	Majorant Series	183
18.2	Poincaré's Lemma	185
18.3	Implicit Functions	192
18.4	Kronecker's Theorem	199
18.5	Poincaré's First Proof of Existence	204
18.6	Bifurcation	209
	POINCARÉ'S PERIODIC SOLUTIONS	219
18.7	Condition for Periodicity	219
18.8	Autonomous Case	227
18.9	Perron's Periodicity Condition	231
18.10	Lefschetz's Condition for Periodicity	236
18.11	Sufficient Condition for Periodicity	240
18.12	Singularly Perturbed Systems	253
	POINCARÉ'S THEORY OF THE SORTS OF PERIODIC SOLUTIONS	264
18.13	Periodic Solutions of the First Sort	264
18.14	Siegel's Theory of Periodic Solutions	274
18.15	Periodic Solutions of Canonical Equations	297
18.16	Periodic Solutions of the Second Sort	302
18.17	Problem of Hecuba	308
18.18	Computation of Periodic Orbits	325
18.19	Periodic Solutions of the Third Sort	339
18.20	Non-Isoperiodic Periodic Solutions	379
18.21	Application to Electric Oscillations	394
	OSCILLATING SATELLITES	402
18.22	Oscillating Satellites around L_1, L_2, L_3	402
18.23	Oscillating Satellites for Elliptic Case	417
18.24	Oscillating Satellites near L_4, L_5	429
18.25	Survey of Orbits near L_4, L_5	448
18.26	Closed Orbits of Ejection	477
18.27	Periodic Motion of an Earth Satellite as a Four-Body Problem	495
	DE SITTER'S THEORY OF JUPITER'S SATELLITES	502
18.28	Periodic Solutions of Four-Body Problem	502
18.29	Motion of Jupiter's Satellites	508
18.30	Equations of Motion	511
18.31	The Intermediary Orbit	518

18.32	The Variations	522
18.33	The Perturbations	527
18.34	Motion of Orbital Plane	530